FACE INVESTIGATION

SUBJECT: Construction Laborer Falls 26 Feet From Leading Edge of Roof

SUMMARY:
A 22-year-old construction laborer (the victim) died after falling 26 feet from the leading edge of a roof to the concrete floor below. The victim was a member of a 7-person crew that was installing sheet metal roof panels on a warehouse under construction. The flat top roof was constructed of metal bar joists, with fiberglass roll insulation and double layers of metal roofing running perpendicular to the joists. Each sheet of roofing measured 50 feet long by 2 feet wide, and the long edges of the roofing panels had molded edges that formed 3 inch high ridges when installed. There was no fall protection equipment in use at the time of the incident. The victim and a co-worker were on the roof carrying a panel toward the leading edge of the roof, when the victim tripped and fell head first over the edge of the roof to the concrete floor 26 feet below. A co-worker called an ambulance, and the victim was pronounced dead at the scene. The FACE investigator concluded that, to prevent similar occurrences, employers should:

- **implement currents standard(s) which require the use of fall protection equipment when working from elevations**

- **select and appoint a designated safety person to develop, implement, and enforce a comprehensive safety program that includes, but is not limited to, training in fall hazard recognition and the use of fall protection equipment**

- **encourage workers to participate actively in workplace safety**

INTRODUCTION:
On September 20, 1994, a 22-year-old construction laborer died of injuries received in a fall from a roof. On September 22, the Wisconsin FACE field investigator learned of the fatality through a newspaper article and investigated of this incident on December 16, 1994. The incident was reviewed with the employer, and reports were obtained from the coroner, sheriff, OSHA, Worker's Compensation, and the state climatologist. The death certificate and photographs of the incident site taken immediately following the incident were reviewed during the investigation.

The employer was a roofing contractor that had been in business for about 22 years and employed about 25 workers on a year-round basis. The company owner directed a safety program that was described as including written safety policies and verbal instruction, although it is unknown if a written policy specifically addressed fall protection. New employees were required to read the safety policies before assignment to work duties, and were given an opportunity to ask questions about the policies. In addition, the company provided on-the-job training to employees. The victim had started employment with the company the day before the incident, and signed a statement that indicated he had read the safety policies. On the first day of work with the company, he received on-the-job training and then did the same type of work as on the day of the incident.

INVESTIGATION:
The employer had been contracted to install a steel roof on a storage warehouse that was under construction. The cement block walls and concrete floor of the building had been installed by another contractor, and the employer in this incident had placed steel bar roof joists approximately 46 inches apart in preparation for laying a flat top metal roof. On the day of the incident, the 7-person work crew met at the company shop at 7 A.M., and traveled about a half hour in a company truck to the building site. The victim mentioned that he had been up most of the night before, and slept in the truck during the entire trip. When a site supervisor asked the victim if he was all right, the victim answered he was okay as long as he kept moving.

The victim and a co-worker were assigned to install fiberglass insulation rolls and sheet metal panels over the steel joists. Each sheet of roofing weighed about 65 pounds, measured 50 feet long by 2 feet wide, and had molded edges that formed 3 inch high ridges along the long edges when installed. The victim and co-worker had been instructed to carry single panels with the top of the panel at chest height, so the workers could see the roofing below them and step over the ridges without stumbling or tripping. Co-workers noted that workers had stumbled and tripped while doing this work in the past, although none had fallen over an edge or through a roof. In addition, the workers were instructed to avoid walking where insulation was visible, and to walk only in the areas that were above an underlying bar joist. Upon reaching the leading edge of the roof, the workers would place the panel perpendicular to the joists and over the insulation layer. After a second panel was installed over the first panel, both were secured to the support beams with self tapping bolts.

By 9 A.M., the work crew had installed three sections, or six panels, and had placed a seventh panel in position. There was no fall protection equipment or safety monitoring system in use on the day of the incident. On that day, the weather was warm and dry with a wind velocity of about 7 mph. The victim was wearing a tee shirt, blue jeans, leather boots, a baseball-type cap and sunglasses. He and co-worker were carrying a panel to the open edge, when the victim lowered the panel to waist height and tripped either on a roofing ridge, or on the lower edge of the panel he was carrying. The victim let go of the panel as he was falling forward toward to the open edge of the roof. His arms were extended forward as he fell through the insulation, and he plunged 26 feet to the concrete floor below. A worker from another company was operating a saw on the floor about 20 feet from where the victim landed, when he heard a noise from the roof area, turned and saw the victim fall head first to the floor. He went to the victim and noticed massive head injuries, then ran to have someone call for emergency services. The ambulance and the coroner responded, and the victim was pronounced dead at the scene. An autopsy was conducted, and blood, urine and vitreous humor samples were tested for alcohol and other drugs.

CAUSE OF DEATH:
The autopsy report noted the cause of death as traumatic injury due to fall from height. Body fluid samples did not detect alcohol or other drugs. The death certificate listed the immediate cause as cerebral hemorrhage with skull fracture.

RECOMMENDATIONS/DISCUSSION

Recommendation #1: Employers should implement current standard(s) which require the use

of fall protection equipment when working from elevations.
Discussion: The company had not provided appropriate fall protection for the crew who was working near unguarded roof edges and leading edges. Although not in effect at the time of the incident, the current OSHA standards in CFR 1926.501 (b) 1 and 2 require the use of guardrail systems, safety net systems, or personal fall arrest systems when workers are on walking/working surfaces 6 feet or more above a lower level. Implementation of one of these systems would have prevented the victim's fall to the pavement.

Recommendation #2: Employers should select and appoint a designated safety person to develop, implement, and enforce a comprehensive safety program that includes, but is not limited to, training in fall hazard recognition and the use of fall protection equipment.
Discussion: The company in this incident had a safety program that was a combination of written and verbal policies and instructions that were given to employees at the time of hire, and enforced by the company owner. It is unknown if policies about fall protection or worker impairment were included in the program. On the day of the incident, a site supervisor noted that the victim showed signs of fatigue, but allowed him to work in a hazardous situation. Also, the hazards of exposing workers to roof edges and leading edges without providing fall protection systems were not recognized and removed.

Recommendation #3: Employers should encourage workers to participate actively in workplace safety.
Discussion: Employers must provide opportunites for workers to carry out their responsibility to participate in making the workplace safer. This could be done by encouraging them to participate in safety committees and to report recognized hazardous conditions to those responsible for implementing the company's safety program. In this instance, the co-workers noticed that the victim was fatigued. In addition, the co-workers were working on unguarded roof edges without fall protection and some were aware of previous near misses where workers had stumbled or tripped on the roof ridges. Company personnel policies should guide supervisory staff in assignment of workers who exhibit signs of impaired judgement and activity. A company safety committee or other mechanism to respond to worker-identified unsafe conditions could have dealt with the hazard of an unguarded leading edge, and decreased the risk of falls. Increased worker participation will aid in the prevention of occupational injury.

REFERENCES

29 CFR, CFR 1926.501 (b) (1),(2) Code of Federal Regulations, U.S. Government Printing Office, Office of the Federal Register.